Self-help interventions for symptoms of depression, anxiety and psychological distress in patients with physical illnesses: a systematic review and meta-analysis

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Self-help interventions for symptoms of depression, anxiety and psychological distress in patients with physical illnesses: A systematic review and meta-analysis

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HIGHLIGHTS

- Systematic review of self-help interventions for distress in physical illness
- Overall between-group difference in efficacy for depression symptoms
- Maximum efficacy in interventions based on therapeutic models
- Larger effect sizes in studies reporting intention-to-treat analysis
- Particularly efficacious in patients with cardiac conditions

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ABSTRACT

Psychological distress, depression and anxiety are common in most physical diseases, and self-help interventions, if effective, might be an important approach to improve outcomes as they are inexpensive to provide to large numbers of patients. The primary aim of this review was to assess randomised controlled trials examining the impact of self-help interventions on symptoms of depression, anxiety and psychological distress in patients with physical illness. Systematic searches of electronic databases resulted in twenty-five eligible studies for meta-analysis (n = 4211). The results of the primary meta-analyses revealed a significant improvement in depression symptoms, in favour of the intervention group (SMD = −0.13, 95% CI: −0.25, −0.02, p = 0.02, I^2 = 50%). There were no significant differences in symptoms of anxiety (SMD = −0.10, 95% CI: −0.24, 0.05, p = 0.20, I^2 = 63%) or psychological distress (SMD = −0.14, 95% CI: −0.40, 0.12, p = 0.30, I^2 = 72%) between intervention and control conditions. Several subgroup and sensitivity analyses improved effect sizes, suggesting that optimal mental health outcomes may be obtained in patients without neurological conditions, and with interventions based on a therapeutic model (such as cognitive behavioural therapy), and with stress management components. This review demonstrates that with appropriate design and implementation, self-help interventions may potentially improve symptoms of depression in patients with physical conditions.

Contents

Abbreviations: RCT, randomised controlled trial; SMD, standardised mean difference; CI, confidence interval; OR, odds ratio; ITT, intention to treat.

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1. Introduction

Mental health problems such as depression and anxiety are common in physical illness (Matcham, Rayner, Steer, & Hotopf, 2013; Mitchell et al., 2011; Reijnders, Ehrt, Weber, Aarslag, & Leentjens, 2008) and are associated with adverse outcomes including: poorer quality of life (Stark et al., 2002); more physical symptoms (Katon, Lin, & Kroenke, 2007); reduced adherence to medication (DiMatteo, Lepper, & Croghan, 2000); increased mortality (Barth, Schumacher, & Herrmann-Lingen, 2004); and increased service use (Boulanger, Zhao, Bao, & Russell, 2009). Therefore reducing depression and anxiety in patients with physical illnesses may improve physical outcomes. However, providing effective intervention for these problems in physically ill populations is often limited by the lack of specialist mental health care provision in physical healthcare environments (Gask, 2005); the reluctance of many patients to take and adhere to anti-depressant medication regimes (Priest, Vize, Roberts, Roberts, & Tylee, 1996); and disease-related factors such as fatigue and physical impairment, which reduce patients' abilities to attend face-to-face meetings with clinicians (Moher et al., 2005).

These limitations have led to an increased focus on 'self-help' approaches to widen access to mental health interventions. Following the English Department of Health's recommendation (Department of Health, 2006), a systematic review examining the published evidence base of information prescriptions proposed that self-help approaches can be delivered in a variety of ways, including self-help manuals, web-based therapies, disease self-management guidance, and patient information, with or without professional support (Chamberlain, Heaps, & Robert, 2008). The review sought to collate the evidence base of research to inform practice, and concluded that providing patients with written materials is cost-effective, and encourages patient participation in care. However, whilst providing useful information to guide clinical practice, this review did not quantify the efficacy of this form of intervention, meaning the true effectiveness and conditions for maximum effectiveness remain unknown.

Recent systematic reviews have found written CBT to be effective for improving common mental health difficulties in patients with affective or emotional disorders (Farrand & Woodford, 2013), and web-based therapeutic intervention to be effective for improving distress in physical illness (Beatty & Lambert, 2013). This review attempts to add to this literature base by focusing on symptoms of depression and anxiety in patients with a primary physical health diagnosis, and providing intervention via written material, rather than online. As many patients' only contact with healthcare professionals is for their physical illness, it is important to maximise this point of contact (Unützer, Schoenbaum, Druss, & Katon, 2006). Establishing the effectiveness of brief self-help interventions, provided by non-mental health professionals, could be an important step in better integrating mental healthcare provision in general medical environments. In most healthcare settings, the need for mental health services far outweighs the availability of mental health services. Establishing effective methods of managing sub-threshold mental health problems in physical healthcare or primary care settings may be a crucial step in reducing demand for limited mental health services, and improving the appropriateness of referrals for mental healthcare services.

Accordingly, the primary aim of this systematic review is to assess and summarise the impact of written self-help interventions on symptoms of depression, anxiety and psychological distress in physical illness. Additionally, sensitivity and subgroup analyses were performed to establish the study variables and aspects of intervention content which may influence efficacy. Secondary aims were to assess the acceptability of self-help interventions in physically ill patients; and to examine any additional benefits of self-help psychological interventions on physical health outcomes, quality-of-life, knowledge and cognitive outcomes.

2. Methods

2.1. Search strategy

The Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA; Moher, Alessandro, Tetszlaff, & Altman, 2009) statement was used to develop a methodological framework and protocol.

Web of Science, PsycINFO, Medline, Embase, PubMed and CENTRAL databases were searched from inception to November 2012, using pre-defined search terms (Appendix A in the Supplementary data).

2.2. Eligibility criteria

Self-help has been defined as: "The use of written materials or computer programmes or the listening/viewing of audio/video tapes for the purpose of gaining understanding or solving problems relevant to a person's developmental or therapeutic needs. The goals of the self-help approach should be relevant to the fields of counselling and clinical psychology" (Williams & Whitfield, 2001, p. 134). In order to focus on interventions provided by non-mental health professionals in physical healthcare environments, this review focused on written materials only, and excluded computer and multi-media interventions. Furthermore, to avoid overlap with more complex interventions, we only included studies with less than 60 min total contact time with a professional. This decision was made with reference to a recent systematic review examining self-help interventions in depression, which defined the maximum amount of professional input as 50% of what would be expected in conventional brief therapy (6–8 h) (Gellatly et al., 2007). Therefore they defined self-help as constituting of a maximum of three hours of professional contact time. We decided that 3 h was still a considerable time investment for "self-help" and made an arbitrary threshold of 60 min, as this seemed to better define the distinction between self-help and a therapeutic intervention supported by self-help materials, and also represented interventions which may be more realistically incorporated into medical healthcare environments.

We defined physical illness as a physical health problem known to have a biological underpinning, a definition previously used in a Cochrane review of the efficacy of antidepressant medication in patients with physical illness (Rayner et al., 2010).

The titles and abstracts for all identified papers were screened against the following inclusion criteria: (1) randomised controlled trial (RCT); (2) participants with one (or more) long term physical illness; (3) providing self-help as the intervention arm of the trial; (4) intervention contact-time provided by a non-mental health professional; (5) assessed and reported depression, anxiety or psychological distress. We did not limit the review to studies which only recruited patients who were symptomatic for anxiety, depression or distress at baseline.

Studies were excluded if they met any of the following criteria: (1) use of audio-visual interventions without written-material intervention; (2) contact-time provided by a mental health professional; (3) provided self-help materials as a control condition for a more extensive intervention; (4) measured quality-of-life, rather than psychological distress; and (5) recruited patients with symptom-based conditions, such as chronic fatigue syndrome or irritable bowel syndrome, which are characterised by the presence of somatic symptoms, rather than an underlying structural or medical abnormality. We excluded studies using patients with a symptom-based diagnosis because the nature of these medically unexplained syndromes is debated, and mental health may be a key aspect in their aetiology.

2.3. Study selection

The titles and abstracts of all studies found through the search strategy were screened for inclusion against the eligibility criteria by the primary author. Then, if it remained unclear whether the paper should be rejected, the full text was obtained and reviewed according to the eligibility criteria.

2.4. Data extraction

Two reviewers (FM and AM) independently extracted the data for each full-text paper, using a structured format (Appendix B in the Supplementary data). Inter-reviewer disagreement was minimal and disagreements were resolved through discussion of the paper with LR, in consultation with MH. If insufficient data were reported to meet the requirements for meta-analysis, the authors were contacted directly to gather the necessary information. If the authors could not be contacted or did not respond, their papers were removed from the meta-analysis and included only in a narrative synthesis.

2.5. Risk of bias

Risk of bias was initially assessed using the Cochrane domain-based quality assessment tool (Higgins et al., 2011), which assesses allocation concealment, sequence generation, blinding, selective outcome reporting and incomplete outcome reporting. Risk of bias was assessed independently by two reviewers to minimise extraction errors, and quantified using the van Tulder Quality Assessment Scale for randomised controlled trials (van Tulder, Furlan, Bombardier, & Bouter, 2003). This 11-item scale measures aspects of bias including: method of randomisation; allocation concealment; blinding; incomplete outcome data; and selective outcome reporting. Cumulative scores range between 0 and 11 and studies scoring 6 or more were considered to have a low risk of bias (van Tulder et al., 2003).

2.6. Outcomes

The primary outcome of interest was depression, anxiety or distress, measured continuously using a validated measure of depression, anxiety or psychological distress. Continuous scores were assessed as mean (M) score values and standard deviations (SD). Psychological distress was conceptualised as encompassing a range of symptoms including sadness, anger, anxiety, depression, and various other negative mood states (Carney & Freedland, 2002). Quality-of-life (QoL) was considered to be an independent construct from psychological distress, due to its stronger association with physical rather than mental well-being. Additionally, mental health QoL measurement tools such as the mental health subscale of the Medical Outcome Survey 36-item Short Form survey (SF-36; Ware & Sherbourne, 1992) were considered to be ineligible, as they have yet to be validated as a measure of psychological distress. Therefore QoL was assessed as a secondary rather than primary outcome of interest.

Secondary outcomes were acceptability and changes in physical function, QoL, knowledge and cognitions. Acceptability was assessed by comparing the attrition levels in patients receiving self-help interventions and those receiving standard care. Changes in physical function, QoL, knowledge and cognitions were examined by comparing mean scores when reported, and were discussed in a narrative synthesis.

2.7. Characterisation of interventions

To compare the differences between levels of guidance on psychological outcomes, interventions were classified into three levels of guidance: 0 was given to interventions with no guidance provided — this would typically include simple mail-out interventions; 1 was given to interventions with some level of guidance — this would typically include interventions provided with either some initial contact time with a healthcare professional, or some form of follow-up; 2 was given to interventions with both contact time and some form of follow-up. The levels of guidance were established independently by two reviewers at the point of data extraction. Disagreement between reviewers was minimal and any disagreement was resolved through discussion of the paper against the aforementioned criteria for guidance level.

2.8. Data analysis

Primary outcome measures were assessed with standardised mean differences (SMDs), calculated using M and SD values, with 95% confidence intervals (CIs). Data were pooled in random-effects meta-analysis in Review Manager 5.0. Heterogeneity was assessed using I^2; with values of 0–40% representing unimportant heterogeneity, 30%–60% representing moderate heterogeneity, 50%–90% representing substantial heterogeneity, and 75%–100% representing considerable heterogeneity (Higgins & Green, 2013). To assess the impact of intervention, end-point scores were initially examined. Acceptability was measured using Mantel–Haenszel odds ratios (ORs) with 95% confidence intervals.

If papers provided means but not standard deviations, and the authors were unavailable, missing standard deviations were calculated by using the mean standard deviation from other papers using the same depression, anxiety, or psychological distress measure. Similarly, if papers reported standard errors and their authors did not respond to our requests for information, standard deviations were calculated from the confidence intervals, standard errors and sample size (Furukawa, Barbui, Cipriani, Brambilla, & Watanabe, 2006).

Sensitivity and subgroup analyses explored the robustness of the results. Planned sensitivity analyses included: the exclusion of studies with a high risk of bias; the exclusion of studies with imputed data; the exclusion of studies without mental health as a primary outcome variable; the exclusion of studies not explicitly based on a therapeutic model; the exclusion of studies not using an intention to treat (ITT) analysis; and the exclusion of studies not targeting distressed patients. A post-hoc sensitivity analysis excluded patients with neurological impairments. Subgroup analyses were planned by: level of guidance; category of physical illness; delivery of intervention (mail-out/in person); and deliverer of intervention. Furthermore, to assess the onset of any psychological impact, a subgroup analysis also compared outcomes at three different time-points: 0–4 weeks, 5–12 weeks and >12 weeks. Sensitivity and subgroup analyses were only performed if there were ≥2 studies able to be pooled. A post-hoc subgroup analysis also divided the interventions up according to aspects of their content, in an attempt to establish the "active ingredients" contributing to effective interventions. This division created three subgroups: informational interventions; stress management interventions; and disease self-management interventions. With one exception, every intervention could be clearly allocated to one of these groups, based on either the author's own description of the intervention or the literature used to justify intervention content. There was no overlap between categories.

Secondary outcomes of interest were loss-to-follow-up, intervention impact on physical function, quality-of-life, knowledge and cognitions. Loss-to-follow-up was determined through comparing end-point numbers of drop-outs from the intervention and control groups in meta-analysis. The high level of heterogeneity in measurement of the other secondary outcomes precluded meta-analysis; therefore these were discussed in a narrative synthesis.

3. Results

3.1. Search results

The electronic database search provided 16,954 relevant articles (Fig. 1). Adjustment for duplicates reduced this number to 12,258. Title screening eliminated a further 11,110 articles, and abstract screening reduced the total number of potentially eligible papers to 454 requiring full-text assessment. This final screening process found that 425 did not meet the eligibility criteria, resulting in a final 29 papers being eligible for inclusion in the systematic review. Four papers did not include sufficient information to be included in the meta-analysis, and their authors did not respond to our requests for further information, therefore 25 papers were included in the final meta-analysis.

3.2. Study characteristics

Table 1 summarises the characteristics of the 29 studies included. Twelve categories of physical illness were identified: cancer (n = 8); stroke (n = 5); cardiac conditions (n = 4); chronic obstructive pulmonary disease (COPD; n = 2); rheumatic diseases (n = 2); intensive care unit (ICU) survivors (n = 2); patients receiving palliative care (n = 1); acquired physical impairment (n = 1); ulcerative colitis (n = 1); HIV (n = 1); acquired hearing loss (n = 1); and epilepsy (n = 1). The ICU survivor samples consisted of patients with pneumonia, sepsis, cervical cord injury, postoperative aspiration, alcoholic liver disease, gastrointestinal bleeding, meningitis, COPD, pancreatitis, postpartum haemorrhage, hypovolemic shock, cardiac arrest, necrotizing fasciitis and bowel resection.

In total, 4739 patients were represented in the studies. Data from 4065 patients contributed to the meta-analyses. Twenty-three studies contributed to meta-analyses of depression outcomes; 20 studies provided information for meta-analyses of anxiety outcomes; and six contributed to meta-analyses of psychological distress outcomes.

Eight studies designed their interventions according to a therapeutic model: one was based on concreteness training (a form of CBT, with a greater emphasis on reflecting on the problems arising during a specific depression episode); and seven on cognitive-behavioural therapy. The HADS was the most common measurement tool for depression (87%), anxiety (82%) and psychological distress (60%). Four (14%) studies only recruited patients exceeding a predefined threshold for depression or anxiety, one study excluded patients with no depression at baseline from data analysis, and three performed post hoc subgroup analysis on patients screening positive for psychological distress at baseline.

3.3. Risk of bias

According to the Cochrane collaboration assessment tool, fifteen of the 29 (52%) included papers reported sufficient information to establish that an adequate method of sequence generation was utilised. Fourteen papers reported adequate concealment of intervention allocation (48%); eight (28%) had adequate blinding of participants and study personnel. Nine reported blinding of outcome assessors (31%), and six (21%) had reported sufficient information to indicate adequate assessment of incomplete outcome data. Eighteen papers indicated a lack of bias due to selective outcome reporting (62%) (Appendix C in the Supplementary data).

According to the van Tulder Quality Assessment Scale, the median methodological quality score was 6 (range 0–10, interquartile range: 3–6). Studies scoring below 6 were excluded from the low risk of bias sensitivity analysis (n = 11) (van Tulder et al., 2003).

Fig. 2 shows the funnel plots created for end-point outcomes of depression and anxiety for all eligible studies. The funnel plot represents a scatterplot of study size against treatment effect and a symmetric distribution would represent a lack of publication bias. The funnel plot of depression was asymmetric with an absence of study data in the lower right hand side of the plot. This indicates a scarcity of smaller trials favouring the control condition. A similar asymmetric pattern is noticeable in the funnel plot of anxiety outcomes. A funnel plot of psychological distress outcomes was not created due to the small number of studies available.

3.4. Impact of interventions on mental health outcomes

Fig. 3 shows the impacts of interventions on end-point outcomes for depression, anxiety and psychological distress. There was a significant between-group difference for end-point depression, in favour of the

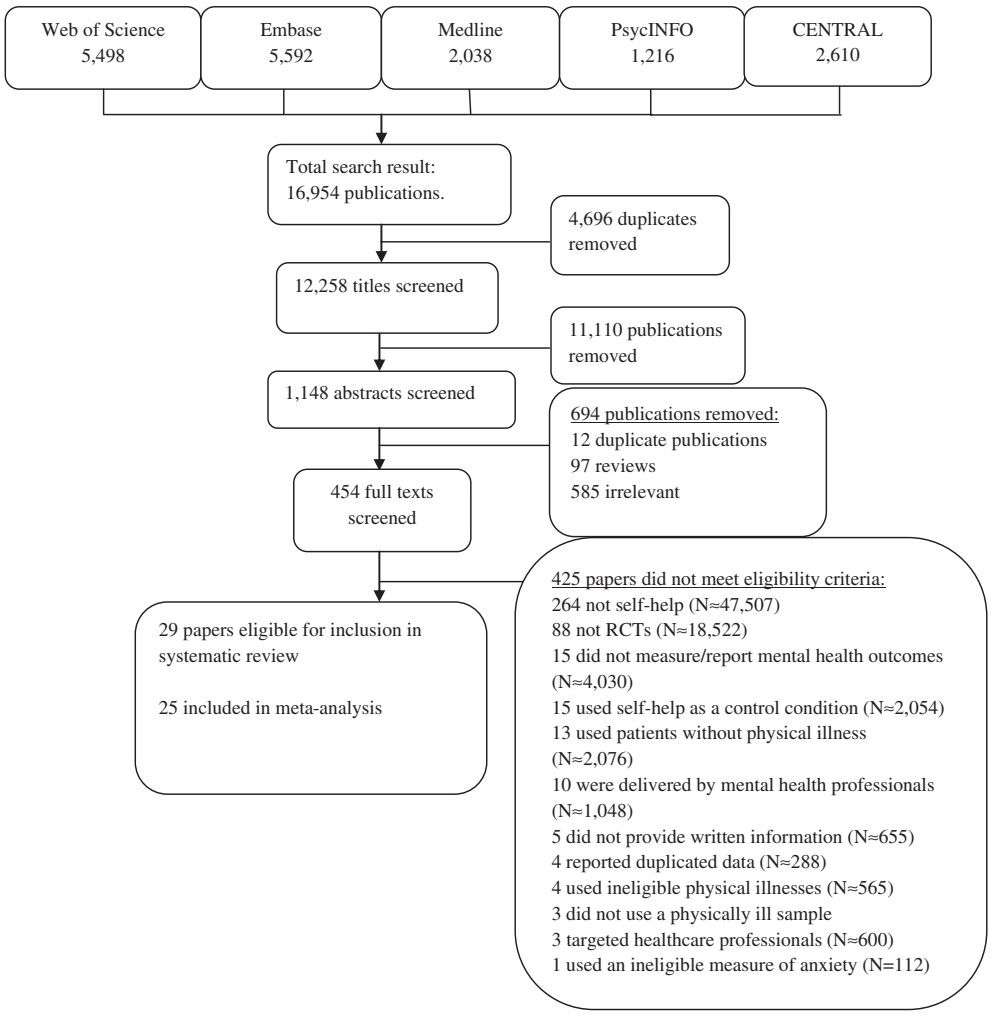

Fig. 1. Search results and study selection.

control group (SMD = −0.13, 95% CI: −0.25, −0.02, p = 0.02, I^2 = 50%). There were no significant between-group differences for endpoint anxiety (SMD = −0.10, 95% CI: −0.24, 0.05, p = 0.20, I^2 = 63%), or psychological distress (SMD = −0.14, 95% CI: −0.40, 0.12, p = 0.30, I^2 = 72%) (Fig. 3).

Of the studies which were not included in the meta-analysis, one found no significant between-group difference in levels of anxiety, depression or distress (Iconomou et al., 2006). Zissiadis et al. (2010) also found no significant between-group differences in either state or trait anxiety levels. Stiegelis et al. (2004) reported that providing cancer patients with a self-management booklet moderated the relationship between illness uncertainty, low control and psychological distress. Jones et al. (2003) found no significant difference between groups for depression or anxiety caseness; however they report a significantly lower level of depression at follow-up in the intervention group in comparison to the control group in a subgroup analysis including patients prescribed anti-depressants before the follow-up measurement.

3.4.1. Sensitivity analyses

Table 2 shows the results of the planned sensitivity analyses. Depression outcomes were relatively stable across sensitivity analyses, with the exception of excluding studies not targeting depressed patients, which eradicated the significant between-group difference. All sensitivity analyses increased effect sizes slightly in comparison to the primary analysis and the largest effect sizes were found when excluding studies not based on a therapeutic model and those not reporting ITT analysis results. For anxiety outcomes, exclusion of studies with patients with a neurological impairment, with imputed data, not based on a theoretical model and studies not reporting ITT analysis all resulted in between-group differences, favouring the intervention group. For psychological distress outcomes, removal of studies not reporting ITT analysis and excluding studies not targeting distressed patients created a between-group difference, in favour of the intervention group. The largest effect size was found when excluding studies not targeting distressed patients.

3.4.2. Subgroup analyses

Subgroup analyses (Table 3) were planned by: level of guidance; category of physical illness; delivery of intervention; deliverer of intervention; and type of intervention. Furthermore, to assess the onset of any psychological impact, a subgroup analysis also compared outcomes at three different time-points: 0–4 weeks, 5–12 weeks and >12 weeks. Additional subgroup analysis examined the impact of different interventional content, the mean age of the sample and the proportion of the sample who were female on depression, anxiety and psychological distress outcomes (Table 3).

The subgroup analyses revealed that self-help interventions may relieve symptoms of depression when provided with some guidance, in patients with cardiac conditions, when outcomes are measured between 5 and 12 weeks, when the intervention contains stress-management material, and when the mean age of the patient is 40–50 years. Symptoms of anxiety may be reduced in patients with cardiac conditions, when the intervention is provided by a researcher, when

Table 1
Summary of included studies.

Study	Physical illness	Setting	Sample size	Conditions/assessments	Primary outcome	Intervention content	Measurement of mental health outcome	Threshold to define "caseness"	Mental health status at baseline (mean, SD)
Meta-analysis									
Andrewes, Camp, Kilpatrick, and Cook (1999)	Epilepsy	Australia, in-patient clinic	110	I: high information group; information pamphlet and video (n = 60). C: low information group; standard information (n = 50). End-point measure: 3–4 days Delivery: researcher	Anxiety	Information	Depression: HADS [23] Anxiety: HADS [23]	Threshold used: none, did not recruit depressed/anxious patients	Baseline depression: I: 4.0 (3.5) C: 5.1 (3.2) Baseline anxiety: I: 8.0 (3.3) C: 8.9 (4.4)
Apps et al. (2009)	COPD	UK, primary care	36	I: Self-management Programme of Activity, Coping and Education (SPACE) manual (n = 17) C: usual care (n = 19) End-point measure: 6 weeks Delivery: not reported	Health status	Disease self-management	Depression: HADS Anxiety: HADS	Threshold used: none, did not recruit depressed/anxious patients	Baseline depression: I: 4.9 C: 4.0 Baseline anxiety: I: 7.4 C: 4.7
Aranda et al. (2012)	Cancer	Australia, outpatient clinic	192	I: pre-chemotherapy information (ChemoEd) including written information, 2× face-to-face session, education DVD and telephone follow-up (n = 98) C: routine care/pre-chemotherapy education (n = 94) End-point measure: 6 weeks Delivery: nurse	Psychological distress	Information	Psychological distress: HADS overall score	Threshold used: performed sub-group analysis of patients scoring ≥ 15.0 at baseline.	Baseline psychological distress: I: 11.4 (6.2) C: 12.1 (7.0)
Beatty et al. (2010)	Breast cancer	Australia, uncertain setting	49	I: self-help workbook ("Finding your way: a workbook to help you cope with your breast cancer diagnosis and treatment") with worksheets and relaxation audiotape/CD (n = 25) C: information booklet (n = 24) End-point measure: 24 weeks Delivery: nurse	Depression, anxiety, post-traumatic stress	Stress-management	Depression: DASS [27] Anxiety: DASS	Threshold used: none, did not recruit depressed/anxious patients	Baseline depression: 6.5 Baseline anxiety: 5.6
De Lorenzo et al. (2004)	Cancer	Italy. outpatient clinic	201	I: information booklet (n = 102) C: verbal information (n = 99) End-point measure: 4 weeks Delivery: doctor	Psychological distress	Information	Psychological distress: PDI [31]	Threshold used: none, did not recruit depressed/anxious patients	Baseline psychological distress: I: 2.3 (0.7) C: 2.1 (0.7)
Eames et al. (2011)	Stroke	Australia, in-patient clinic	138	I: computer-generated, tailored written information booklet, verbal reinforcement and telephone follow-up (n = 71) C: standard care (n = 67) End-point measure: 12 weeks Delivery: occupational therapist	Stroke knowledge	Information	Depression: HADS Anxiety: HADS	Threshold used: none, did not recruit depressed/anxious patients	Baseline depression: I: 5.4 (3.8) C: 5.0 (3.4) Baseline anxiety: I: 8.7 (4.5) C: 7.5 (4.2)
Frank et al. (2000)	Stroke	UK, primary care	39	I: workbook and 2× face-to-face session (n = 19) C: WLC (n = 20) End-point measure: 4 weeks Delivery: researcher	Functional limitations	Stress-management	Depression: HADS Anxiety: HADS	Threshold used: none, did not recruit depressed/anxious patients	Baseline depression: I: 6.6 (4.2) C: 6.2 (3.9) Baseline anxiety: I: 7.8 (5.2) C: 7.9 (3.6)
Furze et al. (2009)	Heart disease	UK, outpatient clinic	204	I: HeartOp programme; patient booklet, relaxation audiotape/CD, daily diary, 1× face-to-face session and telephone follow-	Anxiety, length of hospital stay	Stress-management	Depression: CDS [25]	Threshold used: none, did not recruit depressed/anxious patients	Baseline depression: I: 93.1 (22.1)

				up (n = 100) C: nurse education and counselling (n = 104) End-point measure: 8 weeks Delivery: nurse			Anxiety: STAI [29]		C: 96.8 (23.5) Baseline anxiety: I: 40.0 (12.3) C: 41.5 (12.7)
Furze et al. (2012)	Angina	UK, outpatient clinic	142	I: HeartOp programme; patient booklet, relaxation audiotape/CD, daily diary, 1× face-to-face session and telephone follow-up (n = 70) C: nurse advice (n = 72) End-point measure: 24 weeks Delivery: nurse	Angina frequency	Stress-management	Depression: HADS Anxiety: HADS	Threshold used: none, did not recruit depressed/anxious patients	Baseline depression: NS Baseline anxiety: NS
Galfin et al. (2012)	Palliative care	UK, inpatient hospice	34	I: concreteness training (CT); 1× face-to-face session, digital recording, booklet and telephone follow-up (n = 19) C: WLC (n = 15) End-point measure: 4 weeks Delivery: researcher	Depression, anxiety	Stress-management	Depression: BDI [26] Anxiety: GAD-7 [28]	Threshold used: BDI: ≥4.0 GAD-7: ≥5.0	Baseline depression: I: 7.3 (4.2) C: 5.8 (2.6) Baseline anxiety: I: 13.5 (4.2) C: 10.0 (5.0)
Garnefski et al. (2011)	Acquired chronic physical impairment	The Netherlands, community	32	I: cognitive behavioural therapy (CBT) workbook and CD-ROM (n = 15) C: WLC (n = 17) End-point measure: 12 weeks Delivery: mail-out	Depression	Stress-management	Depression: HADS	Threshold used: ≥3	Baseline depression: I: 6.0 (3.1) C: 5.6 (3.0)
Garnefski and Kraaij (2012)	Acquired hearing loss	The Netherlands, community	45	I: cognitive behavioural therapy (CBT) workbook and CD-ROM (n = 19) C: WLC (n = 26) End-point measure: 12 weeks Delivery: mail-out	Depression/anxiety	Stress-management	Depression: HADS Anxiety: HADS	Threshold used: ≥3.0 on either depression or anxiety scale.	Baseline depression: I: 7.3 (4.6) C: 6.9 (3.6) Baseline anxiety: I: 7.6 (4.4) C: 7.6 (4.3)
Garnefski et al. (2013)	Rheumatic diseases	The Netherlands, community	82	I: cognitive behavioural therapy (CBT) workbook and CD-ROM (n = 41) C: WLC (n = 41) End-point measure: 12 weeks Delivery: mail-out	Depression/anxiety	Stress-management	Depression: HADS Anxiety: HADS	Threshold used: recruited patients scoring ≥ 15 on PHQ-9.	Baseline depression: I: 16.4 (3.2) C: 15.9 (3.4) Baseline anxiety: I: 17.0 (3.2) C: 17.6 (3.9)
Hackett et al. (2012)	Stroke	Australia, in-patient clinic	201	I: personalised post cards (n = 100) C: usual care (n = 101) End-point measure: 24 weeks Delivery: mail-out	Depression	Information	Depression: HADS Anxiety: HADS Psychological distress: HADS overall score	Threshold used: none, excluded depressed/anxious patients	Baseline depression: I: 2.2 (SE: 0.3) C: 1.8 (SE: 0.2) Baseline anxiety: I: 2.8 (SE: 0.4) C: 1.8 (SE: 0.3) Baseline psychological distress: I: 5.0 (SE: 0.6) C: 3.6 (SE: 0.5)
Haggemark et al. (2001)	Cancer	Sweden, out-patient clinic	141	I: information brochure (n = 72) C: standard information (n = 69) End-point measure: uncertain Delivery: mail-out	Satisfaction with information, depression, anxiety	Information	Depression: HADS Anxiety: HADS Psychological distress: IES [33]	Threshold used: none, did not recruit depressed/anxious patients	Baseline depression: I: 3.3 C: 3.3 Baseline anxiety: I: 5.5 C: 5.3
Hoffman et al. (2007)	Stroke	Australia, in-patient clinic	133	I: 1× face-to-face session, tailored information booklet (n = 66)		Information		Threshold used: none, did not recruit depressed/anxious patients	Baseline depression:

(continued on next page)

Table 1 (*continued*)

Study	Physical illness	Setting	Sample size	Conditions/assessments	Primary outcome	Intervention content	Measurement of mental health outcome	Threshold to define "caseness"	Mental health status at baseline (mean, SD)
				C: generic written information (n = 67) End-point measure: 12 weeks Delivery: nurse	Knowledge, self-efficacy, anxiety and depression, perceived health status		Depression: HADS Anxiety: HADS		I: 5.0 (3.9) C: 4.7 (3.3) Baseline anxiety: I: 6.4 (4.2) C: 6.9 (4.3)
Kennedy et al. (2003)	Ulcerative colitis	UK, outpatient clinic	240	I: informational guidebook (n = 119) C: standard care (n = 121) End-point measure: 36 weeks Delivery: uncertain	Anxiety	Disease self-management	Depression: HADS Anxiety: HADS Psychological distress: HADS overall score	Threshold used: none, did not recruit depressed/anxious patients	Baseline depression: I: 5.4 C: 5.1 Baseline anxiety: I: 8.4 C: 8.5 Baseline psychological distress: I: 13.8 C: 13.5
Knowles and Tarrier (2009)	ICU survivors	UK, inpatient clinic	36	I: prospective patient diary (n = 18) C: standard care (n = 18) End-point measure: 3 weeks Delivery: nurse	Depression, anxiety	Stress-management	Depression: HADS Anxiety: HADS	Threshold used: none; excluded patients with significant psychological symptomatology prior to admission.	Baseline depression: I: 6.7 (4.6) C: 8.9 (5.1) Baseline anxiety: I: 6.6 (3.9) C: 7.2 (4.6)
Kraaij et al. (2010)	HIV	The Netherlands, community	48	I: CBT workbook and CD-ROM (n = 24) C: WLC (n = 24) End-point measure: 12 weeks Delivery: mail-out	Depression	Information	Depression: HADS	Threshold used: none; however excluded patients with none or only one depressive symptom at baseline.	Baseline depression: I: 7.3 (4.5) C: 8.0 (3.3)
Krischer et al. (2007)	Cancer	USA, community	310	I: 1× face-to-face session, booklet (n = 154) C: standard care (n = 156) End-point measure: 3 weeks Delivery: nurse	Quality of life, psychological distress	Stress-management	Depression:CESD [24] Anxiety: STAI	Threshold used: none; however performed subgroup analysis comparing intervention effects for patients with high and low distress according to the SF-36.	Baseline depression: I: 11.9 (9.9) C: 10.1 (8.7) Baseline anxiety: I: 34.8 (12.7) C: 34.0 (11.1)
Lewin et al. (1992)	Myocardial infarction	UK, inpatient clinic	190	I: "Heart Manual"; manual, exercise programme, relaxation audiotape (n = 88) C: attention-control (n = 88) End-point measure: 52 weeks Delivery: researcher	Depression, anxiety	Stress-management	Depression: HADS Anxiety: HADS Psychological distress: GHQ	Threshold used: none, did not recruit depressed/anxious patients	Baseline depression: I: 5.1 (3.3) C: 4.2 (3.2) Baseline anxiety: I: 7.5 (3.5) C: 7.3 (4.0)
Lewin et al. (2002)	Angina	UK, primary care	142	I: "The Angina Plan"; workbook, relaxation audiotape and 1× face-to-face session (n = 68) C: education session (n = 74)	Depression, anxiety	Stress-management	Depression: HADS Anxiety: HADS	Threshold used: none, did not recruit depressed/anxious patients	Baseline depression: I: 4.9 (3.5) C: 4.8 (3.5)

				End-point measure: 24 weeks Delivery: nurse					Baseline anxiety: I: 7.3 (4.4) C: 7.1 (5.0)
Lorig et al. (2004)	Arthritis	USA, database	1090	I: mailed self-management programme (SMART); tailored printed information, action planning, relaxation audiotapes (n = 522) C: usual care (n = 568) End-point measure: 168 weeks (3 years)* Delivery: mail-out	Pain, disability, physician visits	Disease self-management	Depression: CESD	Threshold used: none, did not recruit depressed patients	Baseline depression: I: 13.2 (9.0) C: 13.2 (9.2)
Mant et al. (1998)	Stroke	UK, inpatient clinic	71	I: 8× mailed Stroke Association information leaflets (n = 37) C: standard care (n = 34) End-point measure: 24 weeks Delivery: mail-out	Knowledge and satisfaction with information.	Information	Depression: HADS Anxiety: HADS	Threshold used: none, did not recruit depressed/anxious patients	Baseline depression: NS Baseline anxiety: NS
McGeoch et al. (2006)	COPD	New Zealand, primary care	159	I: standardised self-management plan; 1× face-to-face session, action plans, written information (n = 86) C: usual care (n = 73) End-point measure: 56 weeks Delivery: nurse	Respiratory outcomes	Disease self-management	Depression: HADS Anxiety: HADS	Threshold used: none, did not recruit depressed/anxious patients	Baseline depression: I: 4.6 (3.7) C: 4.1 (2.9) Baseline anxiety: I: 6.2 (4.2) C: 5.3 (3.6)
Systematic review									
Iconomou et al. (2006)	Cancer	Greece, out-patient clinic	145	I: 1× face-to-face session, patient booklet (n = 72) C: routine verbal information (n = 73) End-point measure: uncertain Delivery: nurse	Satisfaction with information and care	Information	Depression: HADS Anxiety: HADS	Threshold used: none; excluded patients with psychiatric problems.	Baseline depression: I: Median = 6.0 C: Median = 6.0 Baseline anxiety: I: Median = 7.0 C: Median = 8.0
Jones et al. (2003)	ICU survivors	UK, inpatient clinic	126	I: rehabilitation package with telephone follow-up (n = 69) C: usual follow-up care (n = 57) Endpoint measure: 24 weeks Delivery: nurse	Physical and psychological recovery	Information	Depression: HADS Anxiety: HADS	Threshold used: none, did not recruit depressed/anxious patients	Baseline depression: I: 6.0 (4.0) C: 6.0 (6.0) Baseline anxiety: I: 8.0 (5.0) C: 8.0 (4.0)
Stiegelis et al. (2004)	Cancer	The Netherlands, outpatient clinic	209	I: information booklet and telephone follow-up (n = 103) C: standard care (n = 106) End-point measure: 12 weeks Delivery: uncertain	Psychological distress	Disease self-management	Psychological distress: POMS [35]	Threshold used: none, did not recruit depressed/anxious patients.	Baseline psychological distress: NS
Zissiadis, Harper, and Kearney (2010)	Cancer	Australia, outpatient clinic	194	I: intensive information booklet and telephone follow-up (n = 92) C: standard information (n = 102) End-point measure: post-radiation therapy Delivery: nurse	Anxiety	Information	Anxiety: STAI	Threshold used: none, did not recruit depressed/anxious patients.	Baseline anxiety: NS

Note: I: Intervention group; C: control group; n: number of participants; TAU: treatment as usual; WLC: wait-list control. * To aid comparison with other studies, only data at 1-year follow-up was utilised. NS: not stated.

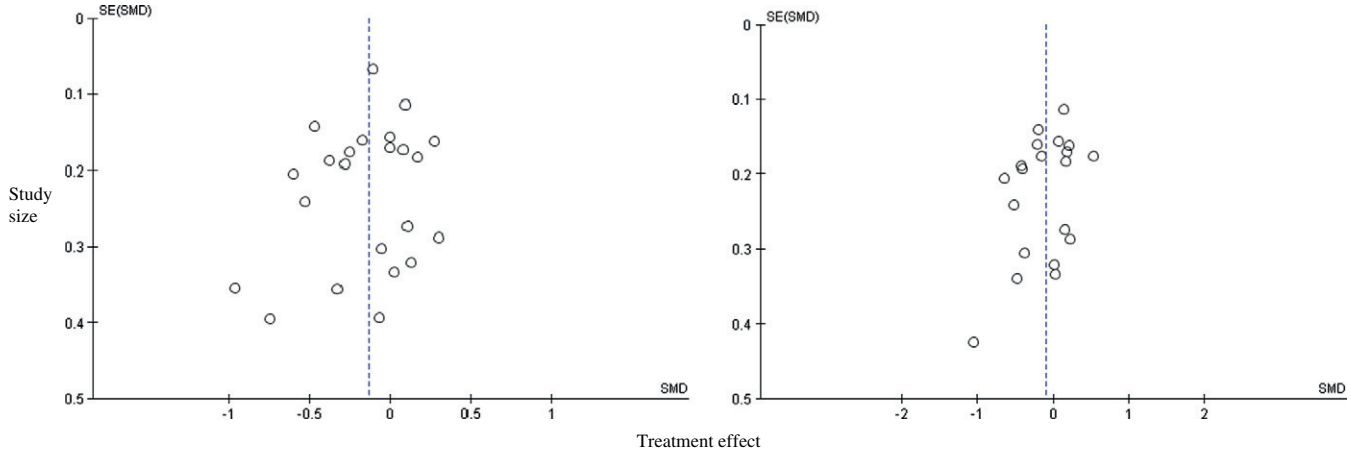

Fig. 2. Funnel plots of end-point outcomes for depression (left) and anxiety (right). Scores below 0 favour the intervention group.

outcomes are measured between 0 and 4 weeks, when the intervention contains stress-management material, and when the mean age of the patient is 40–50 years. Self-help interventions were associated with a worsening of anxiety symptoms in stroke patients. Self-help interventions may reduce psychological distress levels when provided with some guidance, by a nurse, with an outcome measurement at >12 weeks, when the intervention contains stress-management material, and when the sample consists of 61–100% female patients.

3.5. Intervention content

One of the subgroup analyses shown in Table 3 indicates the impact of interventions divided according to intervention content: informational (n = 10); stress-management (n = 12); or disease self-management (n = 5).

3.5.1. Informational interventions

The subgroup analysis of interventions with informational content found that they tended to be ineffective for improving symptoms of depression (SMD = −0.12, 95% CI: −0.36, 0.13, p = 0.36), anxiety (SMD = 0.03, 95% CI: −0.26, 0.32, p = 0.86) or psychological distress (SMD = 0.06, 95% CI: −0.27, 0.40, p = 0.71).

Informational interventions tended to consist of brochures or leaflets providing more information about the nature of the physical illness, and about treatment for that illness. Levels of guidance varied, ranging from a one-off interview (Hoffman, McKenna, Worrall, & Read, 2007), to extensive telephone follow-up both pre- and post-discharge (Eames, Hoffmann, Worrall, Read, & Wong, 2011). Exclusion of studies with no guidance did not substantially alter the results of this subgroup analysis of depression (SMD = −0.15, 95% CI: −0.54, 0.25, p = 0.47) or anxiety (SMD = −0.01, 95% CI: −0.43, 0.41, p = 0.96).

Two interventions used computer-generated tailored information interventions (Eames et al., 2011; Hoffman et al., 2007). This involved asking patients to identify the topics they would like to receive information about, and the amount of information they would like to receive (detailed vs. shortened). These tailored information interventions resulted in a near-significant difference in anxiety symptoms between groups, in favour of the control group (SMD = 0.35, 95% CI: −0.02, 0.72, p = 0.06), but no differences in depression or psychological distress symptomatology.

3.5.2. Stress management interventions

The subgroup analysis of interventions utilising stress-management techniques found significant between-group differences in favour of the intervention group in symptoms of depression (SMD = −0.21, 95% CI: −0.38, −0.04, p = 0.01), and anxiety (SMD = −0.22, 95% CI: −0.41, −0.03, p = 0.02).

Stress management interventions typically combined information provision with relaxation exercises, goal setting and cognitive restructuring. All twelve studies incorporated a mindfulness meditation or relaxation audio component. Nine (82%) used goal-setting as part of their intervention and a subgroup analysis of these studies appears to increase the effect sizes for both depression (SMD = −0.29, 95% CI: −0.47, −0.11, p = 0.002) and anxiety (SMD = −0.23, 95% CI: −0.39, −0.08, p = 0.003) symptoms. Ten (91%) interventions included some form of cognitive restructuring, often targeting aspects of self-blame, positive thinking, survivorship, and common disease or treatment misconceptions. Additional components included in stress-management interventions were: social support development; paced breathing; activity pacing; and the use of daily diaries to record progress.

Stress management interventions varied in the amount of support offered, with 2 offering no guidance, 4 offering some guidance, and five offering substantial guidance. There was no clear difference in effect size between those offering none and some guidance (data not shown); however a subgroup analysis of stress management interventions providing substantial guidance (usually in the form of an initial introduction or assessment interview and/or follow-up phone-calls) found slightly larger effect sizes for symptoms of depression (SMD = −0.33, 95% CI: −0.50, −0.15, p < 0.001) and anxiety (SMD = −0.27, 95% CI: −0.49, −0.06, p = 0.01).

3.5.3. Disease self-management interventions

The subgroup analysis of interventions with disease self-management content found that they tended to be ineffective for improving symptoms of depression (SMD = −0.03, 95% CI: −0.22, 0.17, p = 0.80), or anxiety (SMD = 0.00, 95% CI: −0.29, 0.29, p = 1.00).

Disease self-management interventions were similar in content to informational interventions; however it focused more on action planning, goal setting and development of coping strategies rather than pure information provision. However there was also variation in the reporting of intervention content; therefore little is known about two of the interventions. All 5 provided some level of information provision; however in addition to this, two provided relaxation exercises (Lorig, Ritter, Laurent, & Fries, 2004; Stiegelis et al., 2004); two developed coping strategies (McGeoch et al., 2006; Stiegelis et al., 2004); and one provided advice about doctor–patient communication (Lorig et al., 2004).

3.6. Secondary outcomes

The extent to which patients participated in the full duration of the intervention was determined by comparing end-point numbers of

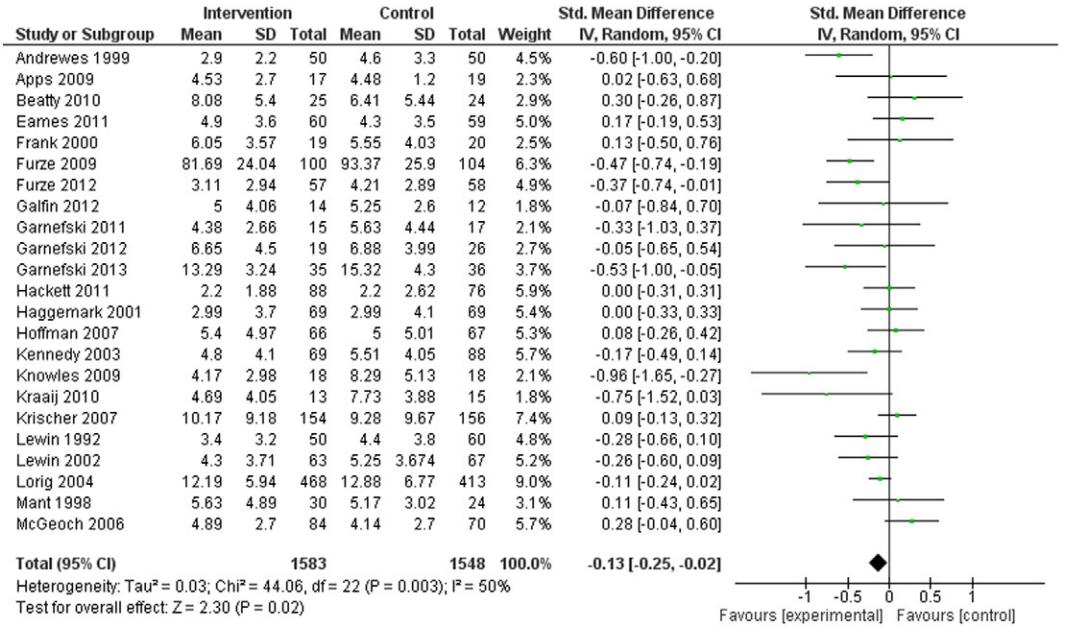

Fig. 3. Impact of self-help interventions on depression (top), anxiety (middle), and psychological distress (bottom) in patients with physical health conditions.

drop-outs from the intervention and control groups (Table 4). Table 5 summarises the impact of written self-help interventions on the four most commonly reported non-mental health outcomes: physical function; quality of life; knowledge; and cognitions.

3.6.1. Loss to follow-up

Only 20 studies, with 3541 patients, provided sufficient information for inclusion in the assessment of loss to follow-up status. At study endpoint, fewer patients withdrew from the control conditions than the intervention conditions (OR = 1.36, 95% CI: 1.01, 1.82, p = 0.04). However, sensitivity analysis excluding studies with high risk of bias revealed no significant difference between intervention and control groups. Subgroup analyses of different time-points revealed no differences in acceptability depending on time-point.

3.6.2. Physical function

Measures of physical function varied; however, self-help interventions were found to significantly improve incremental and endurance shuttle-walking tests in COPD patients receiving a self-management intervention in comparison to those in the control group (Apps, Wagg,

Table 2
Impact of self-help interventions on mental health outcomes: sensitivity analyses.

Outcome	Analysis	Number of studies	Number of participants	SMD (95% CI)	p value	I^2 statistic (%)
Depression	**Primary analysis**	**23**	**3131**	**−0.13 (−0.25, −0.02)**	**0.02**	**50**
	Excluding studies with patients with neurological impairment	**17**	**2522**	**−0.17 (−0.30, −0.04)**	**0.01**	**51**
	Excluding studies with high risk of bias	**15**	**2072**	**−0.20 (−0.34, −0.07)**	**<0.01**	**42**
	Excluding studies with imputed data	**16**	**1625**	**−0.21 (−0.36, 0.06)**	**<0.01**	**51**
	Excluding studies without mental health as a primary outcome	**16**	**1733**	**−0.21 (−0.35, −0.06)**	**<0.01**	**52**
	Excluding studies not based on therapeutic model	**8**	**651**	**−0.37 (−0.53, −0.22)**	**<0.001**	**0**
	Excluding studies not reporting ITT	**6**	**602**	**−0.27 (−0.52, −0.02)**	**0.04**	**51**
	Excluding studies not targeting depressed patients	6	303	−0.21 (−0.50, 0.08)	0.15	33
Anxiety	Primary analysis	20	2190	−0.10 (−0.24, 0.05)	0.20	63
	Excluding studies with patients with neurological impairment	**14**	**1581**	**−0.16 (−0.31, 0.00)**	**0.05**	**54**
	Excluding studies with high risk of bias	12	1131	−0.14 (−0.36, 0.07)	0.18	65
	Excluding studies with imputed data	**14**	**1565**	**−0.19 (−0.35, −0.03)**	**0.02**	**52**
	Excluding studies without mental health as a primary outcome	14	1673	−0.15 (−0.34, 0.04)	0.12	70
	Excluding studies not based on therapeutic model	**6**	**591**	**−0.33 (−0.50, −0.15)**	**<0.001**	**10**
	Excluding studies not reporting ITT	**7**	**673**	**−0.26 (−0.45, −0.06)**	**0.01**	**29**
	Excluding studies not targeting anxious patients	4	243	−0.34 (−0.92, 0.25)	0.26	78
Psychological distress	Primary analysis	6	865	−0.14 (−0.40, 0.12)	0.30	72
	Excluding studies with patients with neurological impairment	5	701	−0.18 (−0.50, 0.14)	0.27	77
	Excluding studies with high risk of bias	4	507	−0.23 (−0.46, 0.01)	0.06	39
	Excluding studies with imputed data	5	816	−0.11 (−0.39, 0.18)	0.47	76
	Excluding studies without mental health as a primary outcome	6	865	−0.14 (−0.40, 0.12)	0.30	72
	Excluding studies not based on therapeutic model	0	0	–	–	–
	Excluding studies not reporting ITT	**2**	**206**	**−0.32 (−0.60, −0.04)**	**0.02**	**0**
	Excluding studies not targeting distressed patients	**2**	**117**	**−0.81 (−1.19, −0.43)**	**<0.001**	**0**

SMD > 0 favours control, and SMD < 0 favours intervention. Bold text denotes significant between-group differences.

Sewell, Williams, & Singh, 2009). Cancer patients receiving an information leaflet reported reductions in vomiting prevalence, severity and bother in comparison to the control group, although no significant between-group differences were seen in symptoms of nausea, infection, hair loss, mouth/throat problems or fatigue (Aranda et al., 2012). A stress-management intervention in cardiac patients resulted in a significant between-group difference in physical function, in favour of the intervention group (Furze et al., 2009); and Lewin, Furze, et al. (2002) report a statistically significant improvement in the intervention group for the number of angina attacks per week and the number of glyceryl trinitrate (GTN) puffs needed per week, in comparison to controls. No significant between-group differences were reported for pain experienced, or the duration of angina attacks. Jones et al. (2003) found a significant improvement in physical function in the intervention group in comparison to the control group at both 8-week and 6-month follow-ups. Lorig et al. (2004) reported a significant difference between the intervention and control groups in terms of physical function at 1-year follow-up, in favour of the intervention group. This difference became non-significant at 2- and 3-year follow-up points. No significant between-group differences were reported for pain at any follow-up point. The intervention group also showed improved role-function in comparison to the control group at 1- and 2-year follow-ups. Global severity was found to be significantly improved in the intervention group, in comparison to controls, at 2-year follow-up only.

3.6.3. Quality of life (QoL)

Apps et al. (2009) reported a significant improvement in emotional QoL in intervention patients in comparison to control patients. Other assessed aspects of COPD-related QoL (dyspnoea, fatigue and mastery) showed no between-group differences using the European Organisation for Research and Treatment of Cancer—QoL scale (EORTC—QoL; Klee, Groenvold, & Machin, 1997). Furze et al. (2012) measured QoL with the EQ-5D (Shaw, Johnson, & Coons, 2005) and found a significant improvement in QoL in the intervention group in comparison to the control group at both 3- and 6-month follow-ups. Iconomou et al. (2006) reported a significant improvement in emotional QoL in cancer patients receiving the intervention in comparison to controls, although no other aspects of QoL (global, physical, role, cognitive or social) were different between groups. Krischer, Xu, Meade, and Jacobsen (2007) used the mental health component of the SF-36 (Ware & Sherbourne, 1992) to assess QoL and found that the intervention group showed a significant improvement in QoL post-intervention in comparison to the control group. Lewin, Thompson, et al. (2002b) reported a significant between-group difference in physical QoL, in favour of the intervention group. Other QoL domains (angina stability, frequency, treatment satisfaction and disease perception) showed no between-group differences.

Beatty, Koczwara, Rice, and Wade (2010) found a significant improvement in the control group for body image, and no between group difference for global QoL. These effects remained stable across both 3- and 6-month follow-up points.

3.6.4. Knowledge

Aranda et al. (2012) found that cancer patients about to undergo chemotherapy receiving the intervention showed reduced psychological and procedural concerns compared to those not receiving the intervention. Eames et al. (2011) reported a significant between-group difference in levels of knowledge about stroke, in favour of the intervention condition. Furze et al. (2009) examined common misconceptions about cardiac conditions and found a significant improvement in perceptions for the intervention group in comparison to the control group. Furze et al. (2012) also found a significant improvement in angina misconceptions in the intervention group, in comparison to controls, at both 3- and 6-month follow-ups. Iconomou et al. (2006) reported that patients receiving the informational intervention had significantly better perceptions of information quality, quantity and satisfaction than patients receiving standard care information. Kennedy et al. (2003) piloted a questionnaire assessing knowledge of inflammatory bowel disease and found that the intervention group showed a significant improvement in knowledge compared to the control group.

3.6.5. Cognitions

Eight studies examined cognitive outcomes such as self-efficacy, helplessness and coping strategies. Four (50%) of these studies reported significant between-group differences.

Beatty et al. (2010) examined the impact of their intervention on coping mechanisms and found that at 3-month follow-up, intervention participants showed significantly reduced levels of helplessness and

Table 3
Impact of self-help interventions on mental health outcomes: subgroup analyses.

Outcome	Analysis		Number of studies	Number of participants	SMD (95% CI)	p value	I^2 statistic (%)
Depression	**Primary analysis**		**23**	**3131**	**−0.13 (−0.25, −0.02)**	**0.02**	**50**
	Level of guidance	0	6	594	−0.05 (−0.21, 0.10)	0.51	0
		1	**9**	**1718**	**−0.22 (−0.43, −0.01)**	**0.04**	**67**
		2	7	790	−0.10 (−0.36, 0.15)	0.42	66
	Physical illness	Cancer	3	497	0.09 (−0.09, 0.26)	0.33	0
		Stroke	5	509	0.08 (−0.09, 0.26)	0.36	0
		Cardiac conditions	**4**	**559**	**−0.36 (−0.53, −0.19)**	**<0.0001**	**0**
		COPD	2	190	0.23 (−0.06, 0.51)	0.12	0
		Rheumatic conditions	2	952	−0.25 (−0.64, 0.14)	0.20	64
	Delivery of intervention	Mail-out	8	1413	−0.12 (−0.24, 0.01)	0.06	7
		In person	13	1633	−0.16 (−0.34, 0.01)	0.07	65
	Deliverer of intervention	Not stated	2	64	−0.33 (−1.08, 0.42)	0.39	55
		None	7	1471	−0.09 (−0.19, 0.01)	0.09	0
		Nurse	6	883	−0.13 (−0.44, 0.18)	0.42	79
		Other*	2	234	−0.10 (−0.63, 0.43)	0.71	77
		Researcher	4	275	−0.29 (−0.59, 0.01)	0.06	30
	Time-point	0–4 weeks	9	978	−0.21 (−0.44, 0.01)	0.06	61
		5–12 weeks	**12**	**1176**	**−0.16 (−0.33, 0.00)**	**0.05**	**46**
		>12 weeks	8	1650	−0.09 (−0.24, 0.06)	0.22	41
	Intervention content	Information-based	8	898	−0.06 (−0.29, 0.17)	0.62	65
		Stress-management	**12**	**1159**	**−0.21 (−0.38, −0.04)**	**0.01**	**44**
		Disease self-management	4	1228	−0.03 (−0.22, 0.17)	0.80	44
	Mean age	**40–50 years**	**4**	**288**	**−0.33 (−0.56, −0.10)**	**<0.01**	**0**
		51–60 years	5	461	0.00 (−0.18, 0.19)	0.96	2
		61–70 years	11	2192	−0.08 (−0.21, 0.06)	0.28	49
	Proportion female	0–40%	6	586	−0.28 (−0.64, 0.07)	0.12	75
		41–60%	8	771	−0.06 (−0.20, 0.08)	0.43	0
		61–100%	7	1638	−0.08 (−0.22, 0.06)	0.29	31
Anxiety	Primary analysis		20	2190	−0.10 (−0.24, 0.05)	0.20	63
	Level of guidance	0	6	594	−0.01 (−0.17, 0.16)	0.95	0
		1	4	809	−0.15 (−0.49, 0.20)	0.41	81
		2	7	787	−0.13 (−0.36, 0.10)	0.27	58
	Physical illness	Cancer	3	497	0.16 (−0.02, 0.33)	0.08	0
		Stroke	**5**	**509**	**0.21 (0.02, 0.41)**	**0.03**	**15**
		Cardiac conditions	**4**	**559**	**−0.27 (−0.44, −0.11)**	**0.001**	**0**
		COPD	2	190	0.17 (−0.11, 0.46)	0.24	0
		Rheumatic conditions	1	71	–	–	–
	Delivery of intervention	Mail-out	5	472	−0.06 (−0.33, 0.21)	0.67	49
		In person	13	1633	−0.14 (−0.33, 0.06)	0.16	72
	Deliverer of intervention	Not stated	1	36	–	–	–
		None	5	558	−0.01 (−0.20, 0.18)	0.92	18
		Nurse	7	1016	0.07 (−0.15, 0.28)	0.55	63
		Other*	2	234	−0.13 (−0.69, 0.44)	0.66	79
		Researcher	**4**	**275**	**−0.48 (−0.82, −0.15)**	**<0.01**	**40**
	Time-point	**0–4 weeks**	**9**	**972**	**−0.26 (−0.51, 0.00)**	**0.05**	**71**
		5–12 weeks	10	1116	−0.10 (−0.34, 0.14)	0.42	74
		>12 weeks	8	933	−0.09 (−0.26, 0.09)	0.34	45
	Intervention content	Information-based	8	898	−0.06 (−0.19, 0.30)	0.66	70
		Stress-management	**10**	**1099**	**−0.22 (−0.41, −0.03)**	**0.02**	**54**
		Disease self-management	3	347	0.00 (−0.29, 0.29)	1.00	40
	Mean age	**40–50 years**	**4**	**228**	**−0.32 (−0.60, −0.03)**	**0.03**	**13**
		51–60 years	5	461	−0.03 (−0.30, 0.25)	0.85	52
		61–70 years	10	1311	−0.02 (−0.22, 0.18)	0.86	66
	Proportion female	0–40%	5	558	−0.12 (−0.38, 0.14)	0.36	53
		41–60%	8	771	−0.08 (−0.36, 0.20)	0.57	70
		61–100%	5	725	−0.02 (−0.27, 0.22)	0.85	58
Psychological distress	Primary analysis		6	865	−0.14 (−0.40, 0.12)	0.30	72
	Level of guidance	0	3	522	0.04 (−0.33, 0.41)	0.83	78
		1	**2**	**159**	**−0.45 (−0.77, −0.14)**	**<0.01**	**0**
		2	1	184	–	–	–
	Physical illness	Cancer	3	434	−0.05 (−0.52, 0.41)	0.82	81
		Stroke	1	164	–	–	–
		Cardiac conditions	1	110	–	–	–
		COPD	0	0	–	–	–
		Rheumatic conditions	0	0	–	–	–
	Delivery of intervention	Mail-out	1	164	–	–	–
		In person	4	652	−0.15 (−0.51, 0.22)	0.43	81
	Deliverer of intervention	Not stated	0	0	–	–	–
		None	2	321	−0.12 (−0.45, 0.20)	0.46	54
		Nurse	**2**	**233**	**−0.26 (−0.51, 0.00)**	**0.05**	**0**
		Other*	1	201	–	–	–
		Researcher	1	110	–	–	–
	Time-point	0–4 weeks	3	588	0.02 (−0.32, 0.36)	0.90	77
		5–12 weeks	3	393	−0.39 (−1.01, 0.22)	0.21	87

(continued on next page)

Table 3 (*continued*)

Outcome	Analysis		Number of studies	Number of participants	SMD (95% CI)	p value	I^2 statistic (%)
		>12 weeks	**4**	**480**	**−0.25 (−0.49, −0.01)**	**0.04**	**41**
	Intervention content	Information-based	3	549	0.06 (−0.27, 0.40)	0.71	75
		Stress-management	**2**	**159**	**−0.45 (−0.77, −0.14)**	**<0.01**	**0**
		Disease self-management	1	157	–	–	–
	Mean age	40–50 years	1	157	–	–	–
		51–60 years	4	544	−0.16 (−0.57, 0.25)	0.44	81
		61–70 years	1	164	–	–	–
	Proportion female	0–40%	1	110	–	–	–
		41–60%	2	365	0.21 (−0.11, 0.52)	0.19	56
		61–100%	**3**	**390**	**−0.27 (−0.47, −0.07)**	**<0.01**	**0**

Note: * doctor, occupational therapist, lay person. Bold text denotes significant between-group differences. SMD > 0 favours control, and SMD < 0 favours intervention.

cognitive avoidance in comparison to the control group. These differences were non-significant at 6-month follow-up. Their other coping assessment, anxious preoccupation, did not show a significant between-group difference at either 3- or 6-month follow-up. Eames et al. (2011) reported a significant between-group difference in levels of self-efficacy for understanding and accessing stroke information, in favour of the intervention condition. Garnefski et al. (2013) found that their intervention significantly improved self-efficacy, a result which was sustained until final follow-up at 3 months. Lorig et al. (2004) found a significant improvement in self-efficacy (measured with the Arthritis Self-Efficacy scale; Lorig, Chastain, Ung, Shoor, & Holman, 1989) in the intervention group, in comparison to controls, at both 1- and 2-year follow-ups. This difference became non-significant at 3-year follow-up.

4. Discussion

We aimed to assess the impact of written self-help interventions on symptoms of depression, anxiety and psychological distress in physical illness; to assess acceptability of self-help interventions; and to examine the impact of self-help interventions on secondary outcomes: functionality, quality-of-life, knowledge and cognitions. It is likely that the biggest gains from establishing the efficacy of this mode of intervention may be found in primary care, where general practitioners will encounter patients with a high level of physical and psychological comorbidities, and available psychological support limited by long waiting lists and psychological interventions not tailored to physical health conditions.

We found some evidence to suggest that provision of written self-help materials may help ameliorate distress in some circumstances. Results from the primary meta-analysis of end-point data showed a small but significant between group difference in depression symptoms, in favour of the intervention group. No statistically or clinically significant differences in anxiety or psychological distress in patients receiving interventions versus controls were found. However, several sensitivity and subgroup analyses altered these findings: the most consistent and notable effect sizes were found when excluding studies not based on therapeutic models, those not reporting ITT analysis, and the subgroup analyses of cardiac and stroke patients, and stress-management interventions. Additionally, the intervention groups showed significantly reduced levels of depression and anxiety in comparison to controls in studies with sample sizes with a mean age ranging between 40 and 50 years.

There was substantial heterogeneity between the studies included in this review, in relation to their aims. Nine studies provided purely information interventions. Other research suggests that provision of information is insufficient to create clinically meaningful reductions in levels of psychological distress (Forster et al., 2012; Husson, Mols, & van de Poll-Franse, 2011). This may be due to individual differences in response to information: Miller (1987) suggests that people under threat (for example, experiencing chronic illness) have different information-seeking styles. Some prefer to receive as much information as possible, whereas others prefer distraction techniques, usually opting to receive as little information as possible. Therefore receipt of information may not be beneficial for all, and those preferring distraction may be negatively influenced by receiving information. Instead, theory driven models of care may be the most effective (Farrand & Woodford, 2013), and our findings support this: excluding studies not based on a therapeutic model such as CBT resulted in a significant difference in effect favouring self-help over control.

However the sensitivity analysis leads to a problem of interpretation. Our a priori hypotheses were based on the principle of including all studies and it is likely that by conducting multiple sensitivity and subgroup analyses we would find new differences by chance. We therefore think that the finding that there may be a small-moderate beneficial effect of self-help based on a therapeutic model seems plausible, although it was not our initial hypothesis and the result cannot be said to be conclusive in supporting the use of self-help.

Removing studies not reporting ITT analyses might be expected to provide a more conservative estimation of effect, and therefore be less likely to produce a significant finding. Our ITT sensitivity analysis contradicts this expectation and the reason for this contradiction is unclear; the papers have no apparent commonalities.

Subgroup analyses provided closer examination of the methodological aspects which may impact results; however, results should be interpreted with caution: the multiple statistical testing involved can increase the chance of Type I error (Munafò & Flint, 2004). These analyses revealed that interventions targeting patients with cardiac conditions may be effective for reducing symptoms of depression and anxiety, and that stroke patients may respond negatively to self-help interventions. The sensitivity analysis excluding patients with neurological impairment also resulted in a significant difference between the intervention and the control group, in favour of the intervention group.

Table 4
Loss to follow-up in self-help intervention versus control for improving mental health in physical illness. Primary analyses, sensitivity analyses and subgroup analyses.

		No. of studies	No. of participants	OR (95% CI)	p value
Primary analysis		**20**	**3541**	**1.36 (1.01, 1.82)**	**0.04**
Sensitivity analysis	Studies with low risk of bias	14	2449	0.85 (0.68, 1.05)	0.14
Subgroup analysis (time-point)	0–4 weeks	8	1098	1.93 (0.73, 5.11)	0.19
	5–12 weeks	9	905	1.57 (0.98, 2.52)	0.06
	>12 weeks	9	2160	1.21 (0.76, 1.92)	0.43

OR < 1 favours intervention, and OR > 1 favours control.

Table 5
Summary of intervention impact on secondary outcomes.

	N. studies	N. participants	Positive impact	Negative impact	No impact
Functionality	12	2479	6	0	6
Quality-of-life	11	1356	5	1	5
Knowledge	10	2029	6	0	4
Cognitions	8	1587	4	0	4

Many of the stroke interventions focused on giving information about the condition, and it may be that doing so comes at the cost of increasing symptoms of anxiety and depression. There is also evidence to suggest that stroke patients may respond particularly poorly to written intervention due to the cognitive deficits often experienced by patients. An analysis of the reading ability of stroke patients revealed that they read at a significantly lower level than other patient groups (Hoffmann & McKenna, 2006). Furthermore, cognitive impairments such as dysphasia and attention deficit are common and may influence the extent to which patients can interpret and retain information (Barker-Collo, Feigin, Lawes, Parag, & Senior, 2010; Patel, Coshall, Rudd, & Wolfe, 2002). The stress caused by being unable to comprehend new material may highlight changes in function as a consequence of the stroke and act to exacerbate distress, rather than alleviate it.

We found that interventions provided by nurses may significantly improve psychological distress. Whilst providing evidence of effectiveness, this result is not conclusive: a small number of studies and patients mean that the results should be interpreted conservatively. Additionally, it was found that interventions provided with no contact with a person significantly improved symptoms of depression. Although the effect size was small, this result supports previous research findings that self-help interventions with minimal contact can produce the most meaningful effects on mental health (Farrand & Woodford, 2013).

Subgroup analysis of intervention content revealed that stress-management interventions showed superior effect sizes for depression and anxiety outcomes than informational or disease self-management interventions. We attempted to identify some of the active ingredients in effective self-help interventions by performing further analyses on intervention content. The most effective interventions tended to involve relaxation therapy, goal setting and cognitive restructuring. However, these results must be interpreted with caution as the further subdivision of a sub-analysis leads to further reduced patient numbers, and increased Type I errors.

Assessment of acceptability showed that at study end-point, patients in the intervention group were more likely to withdraw from the study than patients in the control group. This result was non-significant when removing studies at high risk of bias, suggesting that the higher quality studies showed similar levels of acceptability for control and intervention participants. Furthermore, between-group differences in acceptability were non-significant when divided according to the time at which outcomes were measured.

In relation to the literature, this review reflects comparable findings to those reported by Beatty and Lambert (2013), who found mixed evidence to support the use of web-based self-help intervention for patients with chronic health conditions. The authors report that different levels of support exist for different conditions, with irritable bowel syndrome, and tinnitus showing strong support; pain showing mixed support; and diabetes, epilepsy, fatigue and cancer showing no support for the efficacy of internet-based self-help intervention. Although these results may also reflect the availability of research for each condition, the findings of our disease-specific subgroup analysis support the notion that different conditions may respond differently to intervention of this kind.

A recent systematic review examined the effectiveness of written CBT to ameliorate distress in patients with emotional disorders (Farrand & Woodford, 2013). We used a comparable search and data analysis methodology to Farrand and Woodford (2013), although we used a much broader range of search terms, resulting in a total search result of nearly 17,000 papers, in comparison to their 7463. This difference may reflect our additional search for physical health conditions. They limited their review to CBT-based interventions, whilst ours examined a broader scope of intervention contents. The authors reported consistently beneficial effects of receiving written CBT interventions, and also found that the effect size for minimal support was greater than the effect size for guided support. Our results support this, to the extent that interventions with a theoretical (commonly CBT) basis appeared to be effective for reducing symptoms of depression and anxiety.

4.1. Limitations

Whilst this systematic review has used rigorous, reproducible methods to assess the research in this field, there are several limitations. We were largely inclusive regarding our criteria for entry into the review, preferring to use subgroup and sensitivity analyses to examine the impact of different methodologies on outcomes. However, a primary limitation is the possibility of publication bias. The funnel plots created for depression and anxiety outcomes demonstrate a scarcity of smaller studies favouring the control condition. The over-representation of studies favouring the intervention condition may have biassed the results of the review against the control condition. Furthermore, our assessment of all outcomes may be influenced by selective reporting bias, whereby only positive results are reported in the papers. During assessment of selective reporting with the Cochrane quality-assessment tool, we noted several papers which may have been biassed in this respect, and notably three papers failed to report any results at all for some of their QoL and functionality outcome measurements.

Our conceptualisation of physical illness as a diagnosis of a single, index condition is a further limitation. Approximately 25% of adults have one or more chronic condition (Boyd & Fortin, 2010). Of the papers included in this review, five (17%) excluded patients with comorbidities. Therefore we cannot know whether the results of this review are more applicable to patients with a single diagnosis or multi-morbidities.

The methodological quality of the included trials could be improved upon: many studies reported insufficient information for a full risk of bias assessment. Methods of standardising the reporting of RCTs have been provided by CONSORT (Consolidated Standards of Reporting Trials; Boutron, Moher, Altman, Schulz, & Ravaud, 2008), and the quality of reporting in papers following CONSORT guidelines is better than those not adopting recommendations (Plint et al., 2006). The high level of between-study heterogeneity makes forming firm conclusions challenging and adherence to CONSORT guidelines may improve this for future reviews.

The type of control groups used could also be improved. Nine of the studies included in this review provided information to their control group. As one of the criteria for entry into this review was the provision of written information, it is likely that many of the participants were subject to co-intervention and true intervention effects may have been underestimated (Sibbald & Roland, 1998). Three studies used wait-list control (WLC) groups, which can also negatively impact intervention quality. WLC patients may decrease their help-seeking behaviours, in anticipation of professional help in the future, which may lead to an overestimation of intervention effects (Cuijpers, Straten, & Andersson, 2008).

Also, the consistent use of ITT analysis techniques would improve study design. Only seven studies included in the meta-analysis used the gold-standard technique of ITT. Additionally, there was a lack of transparency regarding the precise ITT methodology used. One of the key benefits of an RCT is the randomisation of participants into groups, which avoids selection bias and creates comparable groups. Changing these groups by removing incomplete data or excluding drop-outs reduces this comparability (Newell, 1992), and is likely to lead to biassed results. Finally, ensuring sample sizes large enough to meet power requirements would substantially improve research quality. Only 19% of the studies included in this review explicitly reported having sufficient power to find significant effects.

4.2. Future research

The limitations discussed here indicate several key areas for future research. Firstly, it is evident that the quality of both the design and reporting of RCTs of self-help interventions for psychological distress

needs some improvement. Adherence to CONSORT guidelines and addressing methodological concerns such as ensuring sufficient power, using ITT analysis and appropriate control conditions may help standardise the quality of RCTs in this field.

Secondly, this field could benefit from the development of self-help interventions based on established therapeutic interventions, such as cognitive behavioural therapy, which have already been shown to be effective in patients with physical conditions, such as cancer (Fors et al., 2011) and heart disease (Burell et al., 2011). Alternatively, the provision of information may result in improved results if researchers take into account the individual differences in their patient group: Williams-Piehota, Pizarro, Schneider, Mowad, and Salovey (2005) found that tailoring information to an individuals' information-processing style (whether they prefer to receive more or less information) significantly improved mammography attendance levels, in comparison to providing blanket information. Future research could benefit from examining if this finding can be replicated in the domain of chronic diseases. This would provide some insight into how to maximise the effectiveness of providing patient information in physical illness. Additionally, more RCTs are required assessing the effectiveness of therapeutic self-help interventions on patients with chronic conditions who are also suffering from mental health problems.

5. Conclusions

Self-help interventions in patients with physical illness may be effective for reducing symptoms of depression. However research in this field is thwarted by methodological and theoretical limitations and therefore higher quality evidence is required to form robust conclusions. Our cautious conclusion is that self-help materials, if based on a theoretical model, may make modest improvements to anxiety and depression scores in patients with physical health problems. Self-help based solely on providing information is probably ineffective, but unlikely to be harmful.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at http://dx.doi.org/10.1016/j.cpr.2014.01.005.

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